

STATE OF SOUTH CAROLINA

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CENOZOIC STRATIGRAPHIC COLUMN

of the

COASTAL PLAIN of SOUTH CAROLINA

1999

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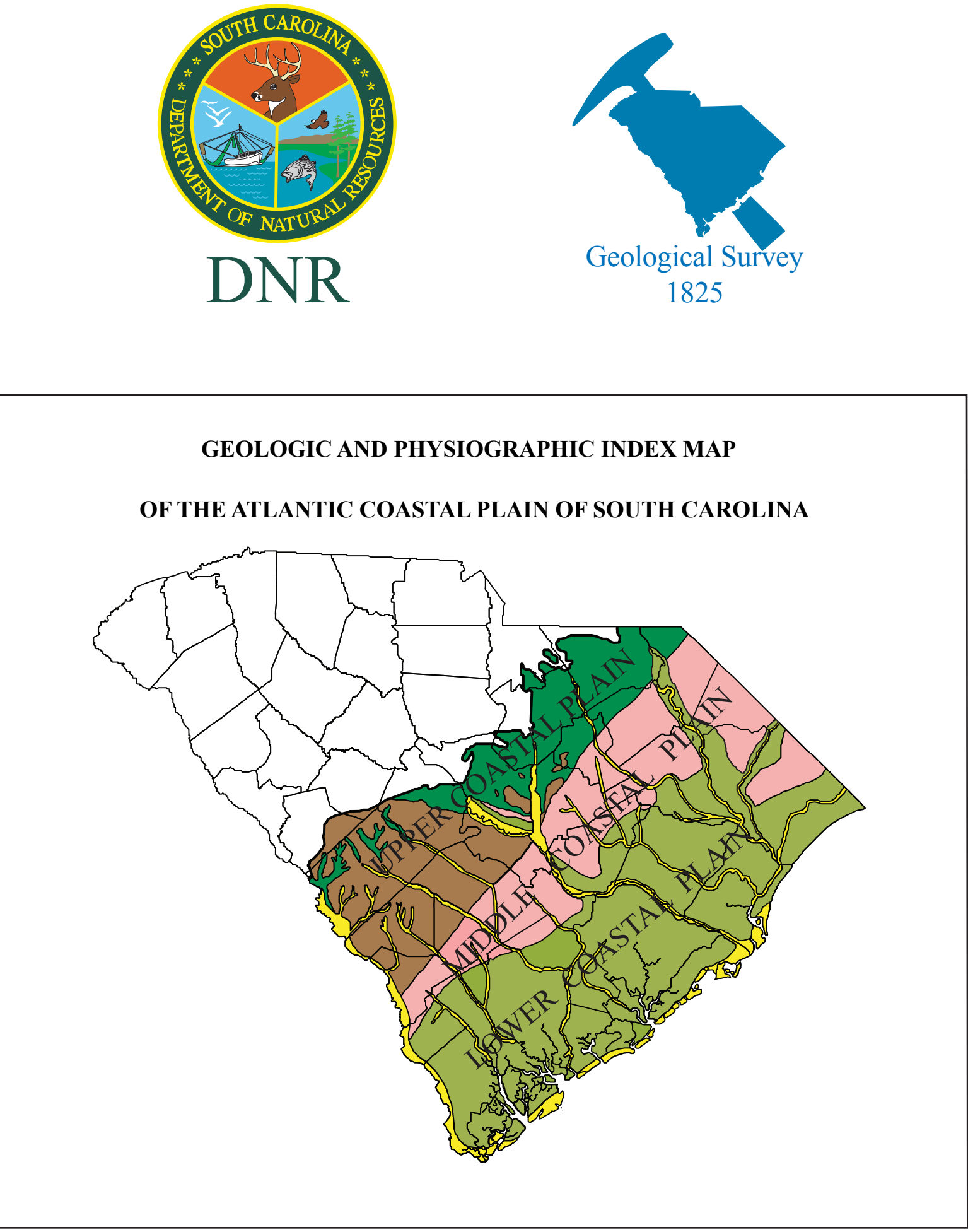
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EXPLANATION

The Cenozoic Stratigraphic Column of the Coastal Plain of South Carolina was compiled from numerous sources. Description and detailed discussion of stratigraphic units and an extensive bibliography are beyond the scope of this chart. No vertical scale (time) nor horizontal scale (distance) is used in the column. Sawteeth indicate a gradation between adjacent stratigraphic units; ka = thousands of years; Ma = millions of years; question marks placed laterally between stratigraphic units indicate a questionable correlation; question marks at the top or bottom of a stratigraphic unit indicate uncertainty of age.

Stratigraphic units in the column are keyed to their occurrence, either surface or subsurface or both, beneath three land divisions. The topography of the South Carolina Coastal Plain is a convenient frame of reference for many of the Cenozoic sediments. Physiographic subprovinces of the Atlantic Coastal Plain in South Carolina are the Upper Coastal Plain, Middle Coastal Plain and Lower Coastal Plain (Colquhoun, 1965, 1969). The Upper Coastal Plain is bounded by the inner margin of the Coastal Plain ("Fall Line" or "Fall Zone") on the northwest and the Orangeburg Scarp on the southeast. The Middle Coastal Plain is bounded by the Orangeburg Scarp and the Surry Scarp. The Lower Coastal Plain is bounded by the Surry Scarp and the Atlantic Ocean. Major river valleys cross the entire Coastal Plain. Lower Paleocene through upper Eocene marine and fluvial units occur in the Upper Coastal Plain and extend, in the subsurface, toward the Atlantic Ocean. The Miocene, fluvial Altamaha Formation, or upland unit, and the Pliocene, eolian Pinehurst Formation also occur in the Upper Coastal Plain. Older Pliocene marine sediments occur in the Lower Coastal Plain, either in the subsurface or at low elevations at the surface. Sediments of two younger Pliocene depositional sequences occur in the Middle Coastal Plain. Pleistocene sediments occur in the Lower Coastal Plain and in some river valleys. Holocene sediments occur at the coast and in the river valleys. Carolina bays, Holocene to older in age, are abundant in the Coastal Plain but are not shown on this chart. The arrangement of subcolumns in the stratigraphic column approximates a cross-sectional view looking northeast.

On the combined physiographic and geologic index map, colors and areas are: white, crystalline rocks of the Piedmont; dark green, Upper Cretaceous sediments in the Upper Coastal Plain, plus minor Piedmont outliers; brown, Paleocene through Pliocene sediments in the Upper Coastal Plain; pink, Pliocene sediments, Middle Coastal Plain; light green, Pleistocene sediments, Lower Coastal Plain; yellow, Holocene, with some Pleistocene terrace sediments in major river valleys. The same colors are used for subcolumns in the stratigraphic column.

The Geological Society of America (Palmer, 1983) recognizes Cenozoic Era, Tertiary Period with Paleogene and Neogene subdivisions, Quaternary Period, and Paleocene Epoch through Holocene Epoch. The United States Geological Survey (Hansen, 1991) recognizes Cenozoic Era, Tertiary Period, Paleogene Subperiod, Neogene Subperiod, Quaternary Period, and Paleocene Epoch through Holocene Epoch. The International Union of Geological Sciences (Cowie and Bassett, 1989; see Van Couvering, 1997) recognizes Cenozoic era, Paleogene period, Neogene period, Quaternary period, and Paleocene epoch through Holocene epoch. Some workers include the Quaternary in the Neogene (see Bates and Jackson, 1987).

The bases of the Paleocene, Eocene, Oligocene, Miocene and Pliocene epochs are dated at 65.0, 55, 33.7, 23.8 and 5.2 million years before present, respectively (Berggren and others, 1995). The base of the Pleistocene Epoch is recognized at Vrica, Calabria, Italy and is dated at 1.815 million years before present (in Van Couvering, 1997).

The Huber Formation and Congaree Formation are placed in the lower middle Eocene and questionably in the upper lower Eocene on the basis of assignment of calcareous nanofossil zone NP14, recognized in the correlative Tallahatta Formation in Alabama (Bybell and Gibson, 1985), at that position by Berggren and others (1995). Correlation of Pliocene strata is after various workers, summarized and reinterpreted by Campbell (1993), Campbell and Campbell (1995) and Campbell and others (1995). Permitted age limits for the Waccamaw Formation, Daniel Island beds and Pringletown beds are adjusted herein, in accordance with the revised age of the base of the Pleistocene (in Van Couvering, 1995).

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ERA	PERIOD OR SUBPERIOD	EPOCH	ATLANTIC COASTAL PLAIN PHYSIOGRAPHIC PROVINCE		
			UPPER COASTAL PLAIN PHYSIOGRAPHIC SUBPROVINCE	MIDDLE COASTAL PLAIN PHYSIOGRAPHIC SUBPROVINCE	LOWER COASTAL PLAIN PHYSIOGRAPHIC SUBPROVINCE
QUATERNARY	HOLOCENE	HOLOCENE	Holocene undifferentiated	Holocene undifferentiated	Holocene undifferentiated < unit Q1
					Silver Bluff beds, or sediments beneath Silver Bluff terrace, >+33 to <+85 ka
					Wando Formation, unit Q2, >+33 ka
					sediments beneath Princess Anne terrace
					to
					sediments beneath Pamlico terrace, or Socastee Formation
					+~130 ka
					Ten Mile Hill beds < unit Q3, +~200 to +~240 ka
					Canepatch Formation < Ladson Formation < unit Q4, +~240 to <+~730 ka
					Penholoway Formation < unit Q5, >+730 to <+970 ka
PLEISTOCENE	PLEISTOCENE	PLEISTOCENE			sediments beneath Wicomico terrace
					unit Q6
					Waccamaw Formation (lecto-stratotype)
					?
					?
					?
					?
					?
					?
					?
PLEISTOCENE	PLEISTOCENE	PLEISTOCENE			sediments beneath Okefenokee terrace
					Holly Hill Member
					Eutawville Member
					Rock Hill beds
					"lower beds at Windy Hill" = "lower Waccamaw Formation" (not stratotype)
					?
					?
					?
					?
					?
PLIOCENE	PLIOCENE	PLIOCENE			Duplin Formation and equivalent, related marine and fluvial sediments beneath Coharie terrace
					?
					?
					?
					?
					?
					?
					?
					?
					?
PLIOCENE	PLIOCENE	PLIOCENE			Pinehurst Formation
					?
					?
					?
					?
					?
					?
					?
					?
					?
PLIOCENE	PLIOCENE	PLIOCENE			upland unit or Altamaha Formation
					?
					?
					?
					?
					?
					?
					?
					?
					?
PLIOCENE	PLIOCENE	PLIOCENE			Rudd Branch beds
					Coosawhatchie Formation
					Ebenezer Member (?)
					Berryville Clay Member (?)
					Tybee Phosphorite Member (?)
					?
					?
					?
					?
					?
PLIOCENE	PLIOCENE	PLIOCENE			Marks Head Formation
					Parachucla Formation
					Porters Landing Member
					Tiger Leap Member (?)
					"Combahee Phase" of Sloan (1908)
					?
					?
					?
					?
					?
PLIOCENE	PLIOCENE	PLIOCENE			Chandler Bridge Formation
					Ashley Formation
					Suwanee Limestone
					Suwanee Limestone
					Lazaretto Creek Formation
					Drayton limestone beds
					Tobacco Road Sand
					Dry Branch Formation
					undifferentiated
					Griffins Landing Member
PALEOCENE	PALEOCENE	PALEOCENE			Orangeburg District bed
					Orangeburg District bed
					Cross Formation (?)
					McBean Formation
					Santee Limestone
					Chapel Branch Member
					Santee Limestone
					Moultrie Member
					Warley Hill Formation
					unnamed limestone
PALEOCENE	PALEOCENE	PALEOCENE			Huber Formation
					Congaree Formation
					Congaree Formation
					?
					?
					?
					?
					?
					?
					?
PALEOCENE	PALEOCENE	PALEOCENE			Fourmile Branch Formation
					Fishburne Formation
					Snapp Formation
					Lang Syne Formation
					Williamsburg Formation
					Williamsburg Formation
					Chicora Member
					Lower Bridge Member
					Rhems Formation
					Perkins Bluff Member
PALEOCENE	PALEOCENE	PALEOCENE			Formation
					Browns Ferry Member
					UPPER CRETACEOUS SEDIMENTS, NOT DIFFERENTIATED

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